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REC'D 29 DEC 2004

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)

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| Applicant's or agent's file reference 4637/RH | FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416) | |
| International application No. PCT/GB 03/03880 | International filing date (day/month/year) 08.09.2003 | Priority date (day/month/year) 20.09.2002 |
| International Patent Classification (IPC) or both national classification and IPC C03C1/02 | | |
| Applicant PILKINGTON PLC et al. | | |

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 7 sheets, including this cover sheet.
 - ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 2 sheets.

3. This report contains indications relating to the following items:
 - I ☒ Basis of the opinion
 - II ☐ Priority
 - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☐ Lack of unity of invention
 - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI ☐ Certain documents cited
 - VII ☐ Certain defects in the international application
 - VIII ☐ Certain observations on the international application

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| Date of submission of the demand 13.02.2004 | Date of completion of this report 28.12.2004 |
| Name and mailing address of the International preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465 | Authorized Officer Maurer, R Telephone No. +49 89 2399-8578  |

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/GB 03/03880**

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-9 as originally filed

Claims, Numbers

11-14 as originally filed

1-10 received on 29.04.2004 with letter of 29.04.2004

Drawings, Sheets

1-3 as originally filed

Drawings, Figures

1-3 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

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☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | |
|-------------------------------|-------------|----------|
| Novelty (N) | Yes: Claims | 1-14 yes |
| | No: Claims | |
| Inventive step (IS) | Yes: Claims | |
| | No: Claims | 1-14 no |
| Industrial applicability (IA) | Yes: Claims | 1-14 yes |
| | No: Claims | |

2. Citations and explanations

see separate sheet

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To point V:

1) Reference is made to the following documents:

- D1: GB-A-887032
- D2: US-A-3294555
- D3: US-B1-6340 650
- D4: GB-A-1282867
- D5: EP-A-1123903.

2) The applicant's arguments as regards inventive step (concerning D1-D2) are not convincing:

2a) As regards D1 the applicant's argument the wording "may be added" in connection with the wetting agent alkali metal salt is not convincing. D1 (page 2, line 24-35) discloses that the storage of the wet batches under controlled temperature conditions will prevent the setting up or hardening of the mixtures from occurring. As regards the applicant's argument that the use of a wetting agent is provided in D1 to achieve a uniform distribution of the alkali metal salt particles among the sand particles, it is noted that according to D1 (page 2, line 116 onwards) this represent a preferred embodiment and also further other sequences are disclosed in D1 (e.g. page 3, line 1-19) with the important consideration of obtaining the maximum of ingredient particles uniformly throughout the batch.

2b) It is true that D2 relates during mixing (e.g. with H₂O) to temperatures like -12,2 °C or -1,1 °C, however claim 1 of the present application relates to the temperature of storage (below 30 °C) and not the mixing temperature and claim 1 of the present application is silent about any mixing temperatures. D2 discloses the storage of the batch at ambient temperature which falls inside the " below 30 °C " according to claim 1 of the present application.

2c) Starting from the teaching of D1 (to use controlled temperature of the batch mixture (above 90 °C = 32,2 °C) in combination with the use of a surfactant) the skilled person, whose aim is to achieve a free flowing batch, would look for the appropriate storage temperature, thus taking into consideration the batch storage temperatures disclosed in D2 (at ambient temperature) would find out the most appropriate storage temperature.

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2d) As regards the applicant's argument that D3 relates to the production of ceramic are convincing, since D3 discloses as major method step a granulation of a mixture of waste glass, filler and optional a surfactant wherein a non-aqueous organic binder is added to the batch formulation.

2e) Accordingly, the objection as regards claims 1-14 of the present application as not fulfilling the requirements of Article 33(3) PCT with respect to D1 and D2 are maintained:

3) Article 33(2) PCT

3a) The closest prior art document D1 GB-A-887032 (page 2, line 24-51 and line 69-130; page 3, line 25-37; examples I,II; claims 1-11) discloses a method of preparing a - moist glass-making batch composition (water content 2-20 wt% of the batch) which comprises the incorporation of

- a surfactant = a soluble soap (alkyl aryl sulphonate) and
- water-soluble component (soda ash)

into the glass batch and

wherein the batch may be preheated.

D1 (page 2, line 5-51) teaches that in order to achieve a storage of the wet batch ingredients for any appreciable length of time (without any setting or hardening of the wet batch mixture) the temperature of the wet batch mixture must be controlled and thus it has been found that wet batches may be made free flowing by regulating the temperature, e.g. by heating the mass to above 90 °C (= 32,2 °C) the thus heated mass is stored, e.g. for 48 hours, and at the end of the period the mixture was still wet, homogeneous and free flowing, no setting occurred (examples)

It is further noted that page 2, line 25-40 discloses that the addition and mixing of an alkali metal salt solution with the glass batch ingredients may be eliminated by controlling the temperature.

The subject-matter of claim 1 of the present application differs from the disclosure of D1 only in that the storage of the batch to be free flowing without setting is at a temperature " below 30°C".

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The person skilled in the art whose aim is to achieve a free flowing glass-making batch would take into consideration the teaching of D1 and find out by simple testing the most appropriate temperature.

Accordingly, claims 1-14 of the present application do not fulfil the requirements of inventive step (Article 33(3) PCT).

3b) It is noted that the present application also does not fulfil the requirements of Article 33(3) PCT as regards D2:

D2 US-A-3294555 (column 2, line 1- column 3, line 24; examples I,II; claims 1-4) discloses

- a method of preparing wet, homogeneous, free flowing glass batches wherein
 - an alkali metal salt solution is added to the preheated glass batch (temperature above 90 °C (= 32,2 °C) and H₂O (content of 5-20%)
- the mixture is kept between 10°F (-12,2°C) -30°F (-1,1°C) and before feeding to the furnace the batch is heated to above 90°F (32,2°C)
- and the optional addition of a wetting agent (e.g. alkylaryl sulfonate: column 3, line 64 - column 4, line 4) and D2 discloses (column 4, line 30-46)
- that the mixture can be stored for several days or even a week without difficulty.

from which the present application, claim 1, differs in that

- the storage is below 30 °C and
- a surfactant is added to the glass batch.

Although D2 does not disclose the exact temperature of the storage, D2 discloses the storage at ambient temperature which falls inside the "below 30 °C" according to claim 1 of the present application.

To add a surfactants to glass batches in order to form free flowing powders is known from D3 US-B1-6340650 (column 3, line 45-62; column 4, line 11-21 and 63-67; column 6, line 1-10; claims 1-21).

It is further noted that the mixture according to claim 1 of the present application is characterized by the term "comprising" accordingly also mixtures containing besides the surfactant additional compounds fall inside said mixture.

The person skilled in the art whose aim is to achieve a free flowing glass batch would take into consideration the teaching of D2 and combine it with the teaching of D1.

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Accordingly, claims 1-14 of the present application do not fulfil the requirements of Article 33(3) PCT.

4) Article 6 PCT

It is clear from the description on pages 4/5 that the following features are essential to the definition of the invention:

- (1) Free water content of 1-20%.
- (2) Specific surfactant-see examples.
- (3) Specific amount of surfactant 0.0001-5% of the batch.
- (4) Specific glass- float glass composition.

Since independent claim 1 does not contain these features it does not meet the requirement following from Article 6 PCT taken in combination with Rule 6.3(b) PCT that any independent claim must contain all the technical features essential to the definition of the invention.

Replaced By
Art 84 AMDT.

Claims:

1. A process for preparing and storing moist glass-making batch which comprises incorporating a surfactant in moist batch whereby, on storage
5 of the batch at a temperature below 35°C, the batch remains free flowing without setting.
2. A process for preparing moist glass-making batch which comprises incorporating a surfactant in the moist batch whereby, on preheating the
10 batch at or above 100°C before supply to a glass melting furnace, the batch remains free flowing without setting.
3. A process as claimed in claim 2 wherein the batch is pre-heated to a temperature of at least 150°C before supply to the glass melting furnace.
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4. A process as claimed in any preceding claim wherein the moist batch includes between 2 % and 10 % free water.
5. A process as claimed in any preceding claim wherein the moist batch
20 includes a water-soluble component.
6. A process as claimed in claim 5 wherein the water-soluble component is soda ash.
7. A process as claimed in any preceding claim wherein the surfactant is
25 chosen from a group including anionic, cationic, non-ionic and zwitterionic surfactants.
8. A process as claimed in claim 7 wherein the surfactant is anionic.
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9. A process as claimed in claim 8 wherein the anionic surfactant is a soluble soap.

10. A process as claimed in claim 9 wherein the soluble soap is a carboxylate having a carbon chain length of between C4 and C22 inclusive.

5 11. A process as claimed in claim 9 or claim 10 wherein the soluble soap includes a Group I, II or III counter-ion.

10 12. A process as claimed in any preceding claim wherein the surfactant is incorporated into the batch in an amount from 0.0001 % to 5 % of the weight of the batch.

13. A process as claimed in any preceding claim wherein the surfactant is incorporated into the batch as the batch ingredients are mixed.

15 14. A process as claimed in claim 1 wherein the moist batch is stored for at least 24 hours.

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